WHERE
IDEAS
CAN
GROW.

MAYR MELNHOF HOLZ

K1 yellowplan

FORMWORK PANELS

HT 20plus

HT 12/16/24/30PLUS

In safe hands

Mayr-Melnhof Holz is committed to sustainable and ecological practices. Informed and responsible management of natural resources – regrowth and expansion of our forests – lies at the heart of our business.

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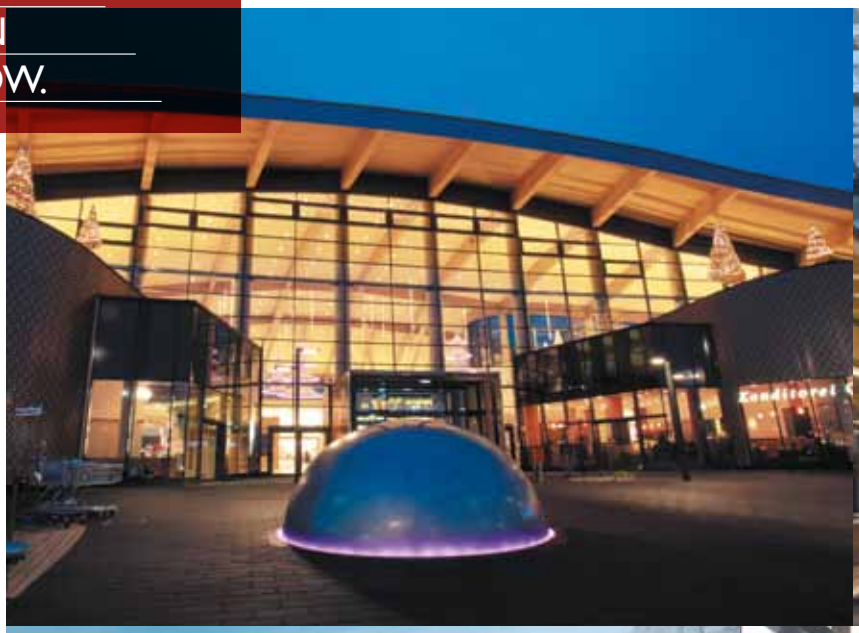
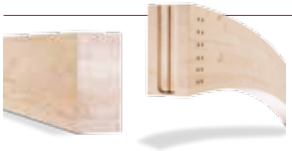
WHERE IDEAS CAN GROW.



Mayr-Melnhof Holz Holding AG is Central Europe's leading timber industry company and has a complete value-added chain from its own forests via sawing up to timber engineering. The roots of our brand date back to 1850 and form the basis for our entrepreneurial thinking, which is reflected in values like quality, modernity, sustainability, and tradition. In glulam construction, we are among the pioneers of the industry and understand ourselves as producer and consultant for perfect solutions in timber from a single source. Our business partners are based in timber trade, timber processing and the construction or packaging industry, respectively. The sawmill locations for the sawn timber area are located in Leoben (Austria), Frankenmarkt (Austria), Paskov (Czech Republic) and Efimovskij (Russia). Timber processing is undertaken in Gaishorn (Austria), Kalwang (Austria), Reuthe (Austria) and Richen (Germany). With a biomass power station at the Leoben site as well as pellet and briquette production at individual locations, Mayr-Melnhof is furthermore active in the area of bio-energy.

Products of Mayr-Melnhof Holz



MM masterline
Glulam beams

MM vistaline
Duo-/Trio beams

MM profideck
Laminated ceiling elements

MM blockdeck
Floor and wall beams

MM crosslam
Cross-laminated timber

K1 multiplan
3-ply structural panels

K1 yellowplan
Formwork panels

HT plus
Formwork beams

MM sawn timber

MM royalpellets

MM royalbriquettes

Mayr-Melnhof Holz Holding AG
Turmgasse 67 · 8700 Leoben · Austria
T +43 3842 300 0 · **F** +43 3842 300 1210
holding@mm-holz.com · www.mm-holz.com

Formwork technology that exceeds your expectations

The HT 20plus formwork beam and formwork panels K1 yellowplan from Mayr-Melnhof Holz are globally established brand products for concrete construction.

As pioneers and quality leaders in formwork and engineered timber construction, we have produced these products for over 50 years at our Reuthe production facility in Austria's Bregenzer wald region.

Thanks to their remarkable quality, our formwork products are used in over 60 countries. Mayr-Melnhof Holz is today one of the leading companies in the industry.

Properties

The concrete formwork beam with the globally proven protective cap system

HT 20plus is the global brand for the concrete formwork beam from Mayr-Melnhof Holz. High-quality materials, flawless workmanship, and the globally proven protective cap system give the **HT** plus formwork beams their unsurpassed lifecycle. **HT 20**plus stands for top quality in construction.

For some 50 years, the **HT 20**plus formwork beam from Mayr-Melnhof Holz has been developing one of the leading brands in concrete construction. With its robustness and exceptional lifecycle, the **HT 20**plus enjoys an elite reputation among industry experts.

In 2010 the product spectrum of the **HT 20**plus was expanded with the addition of four new beam types, the **HT 12**plus, **HT 16**plus, **HT 24**plus and **HT 30**plus.

The range of our current product line allows for specifi - cally tailored applications of our formwork beams. The ability to select the optimal beam type allows structural engineers, technicians, and project managers to further improve effi ciency.

Indestructible finger jointing

between chord and web

Chords

made of high-quality, specially graded solid timber

The shock-resistant, bevelled protective cap

made of synthetic materials provides protection from splintering at the chord ends, signifi cantly increasing the durability

Webs

ensure high carrying capacity for continuous use in all climate zones

Unique labelling

The length and production date printed on top of the chord provide a unique labelling of the **HT** plus formwork beams

Technical data

Product

Wooden formwork beams, glued, solid-walled I-beams

Wood species

Spruce, fir, mixed types available

Wood moisture

12% ± 3%

Gluing

Melamine resin-based adhesive, adhesive type I EN 301 approved for gluing of load-bearing wood structural elements.

Chord

- Visually graded to strength class S10 acc. to DIN 4074
- Finger-jointed, high-grade, solid whitewood, fi ngerjoints acc. to DIN 68140-1
- Chords are grooved on the side turned away from the core (left side of chord surface)
- Smoothly surfaced and chamfered to approx. 4 mm

Webs

- 3-ply solid wooden panel for structural and exterior application acc. to EN 13353
- Primarily vertical growth rings in outer and middle layer

Surface protection

Treatment of entire beam using a water-resistant color stain.

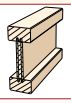
Support

Due to the 3-ply solid wood webs, **HT** plus formwork beams can be cut into and supported at any length.

Packaging

The packages are delivered suitable for the construction site and protected by integrated supporting timber.

Product overview

Formwork beam	**HT 12**plus	**HT 16**plus	**HT 20**plus	**HT 24**plus	**HT 30**plus
					
Weight and dimensions					
Beam height	120 mm	160 mm	200 mm	240 mm	300 mm
Chord height	35 mm	35 mm	40 mm	40 mm	57 mm
Chord width	65 mm	65 mm	80 mm	80 mm	96 mm
Web thickness	26.6 mm	26.6 mm	26.6 mm	26.6 mm	26.6 mm
Web thickness	2.8 kg/m	3.3 kg/m	4.6 kg/m	5.1 kg/m	7.6 kg/m
Calculated values					
EI MOE x moment of inertia	97 kNm²	212 kNm²	486 kNm²	775 kNm²	1,906 kNm²
E_{Gurt} Modulus of elasticity chord (C24)	11,000 N/mm²	11,000 N/mm²	11,000 N/mm²	11,000 N/mm²	11,000 N/mm²
E_{Steg} Modulus of elasticity web (3-ply panel)	6,700 N/mm²	6,700 N/mm²	6,700 N/mm²	6,700 N/mm²	6,700 N/mm²
V_k Characteristic value of lateral force	15.3 kN	18.4 kN	23.9 kN	28.2 kN	34.5 kN
$R_{b,k}$ Characteristic value of supporting	29.4 kN	36.8 kN	47.8 kN	56.4 kN	69 kN
M_k Characteristic value of moment	4.4 kNm	5.9 kNm	10.9 kNm	14.1 kNm	26.2 kNm
Quality-monitored production	WPK	WPK	WPK + MPA	WPK	WPK

FPC = Internal factory production control / MPA = External monitoring by Material Testing Institute in Stuttgart

Carrying capacity values for the construction site

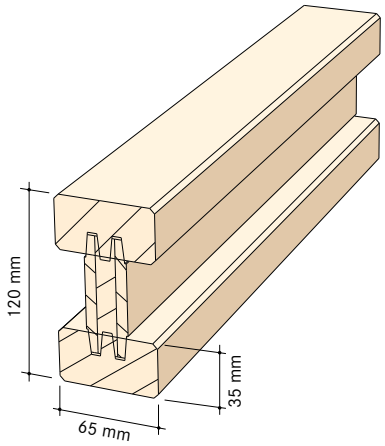
Conversion of characteristic value for permissible measurement value using old measurement concept according to EN 13377 Appendix E

$X_d = k_{mod} \times X_k / \gamma_m$
X_d *Rated value of material property*
X_k *Characteristic value of material property*
k_{mod} *Modification value of wood moisture < 20% is 0.9*
γ_m *Partial safety factor for wood and wood materials is 1.3*
perm. $X = X_d / \gamma_F$
perm. X = *Permissible value of material property*
γ_F *Partial safety factor for the load is 1.5*

Technical data HT 12plus

Dimensions and tolerances

Dimensions	HT 12plus	Tolerances
Beam height	120 mm	± 2.0 mm
Chord thickness	35 mm	- 1.5%
Chord width	65 mm	- 1.5%
Web thickness	26.6 mm	± 0.5 mm



Product standard

The EN 13377 defines the classification, requirements and test methods for formwork timber beams with building heights of h = 16 cm, h = 20 cm and h = 24 cm. The formwork timber beams HT 12plus and HT 30plus are manufactured with reference to this standard.

Calculated values

According to EN 13377	Carrying capacity characteristics	
Lateral force	V_k = 15.3 kN	perm. Q = 7 kN
Bending moment	M_k = 4.4 kNm	perm. M = 2.1 kNm
Reaction of support	$R_{b,k}$ = 29.4 kN	

MOE x moment of inertia	EI = 97 kNm²	
Elasticity module of chord (C24)	E_{Gurt} = 11,000 N/mm²	
Elasticity module of web (SWP)	E_{Steg} = 6,700 N/mm²	

Standard lengths

2.45/2.50/2.65/2.90/3.30/3.60/3.90/4.20/4.50/4.90/max. 5.00 m

Weight

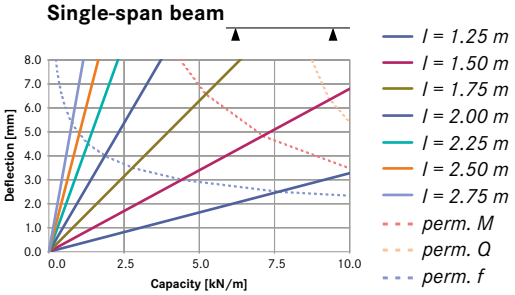
2.8 kg/m

Package units

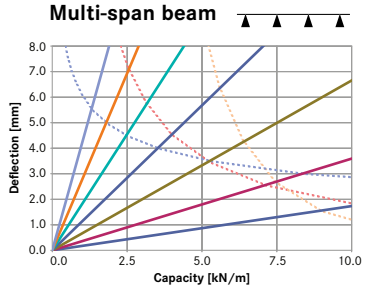
Standard package: 144 pieces

Span table

Single-span beam



Multi-span beam



PEFC Chain of Custody

TÜV AUSTRIA

		Table 1: Crossbeams Distance between crossbeams [m]								Table 2: Main beams Selected distance between main beams [m]				
		0.3	0.4	0.5	0.625	0.675	0.75	0.875	1	1.25	1.5	1.75	2	2.25
Floor thickness [cm]	**Total load** [KN/m²]	**Max. support width of crossbeam = Max. distance between main beams**								**Max. permissible support width = Distance between supports**				
10	4.60	2.52	2.29	2.13	1.97	1.92	1.86	1.76	1.69	1.57	1.47	1.40	1.32	1.24
12	5.12	2.39	2.18	2.02	1.87	1.83	1.76	1.68	1.60	1.49	1.40	1.33	1.25	1.18
14	5.64	2.29	2.08	1.93	1.79	1.75	1.69	1.60	1.53	1.42	1.34	1.27	1.19	1.10
16	6.16	2.20	2.00	1.86	1.72	1.68	1.62	1.54	1.47	1.37	1.29	1.22	1.14	1.01
18	6.68	2.12	1.93	1.79	1.66	1.62	1.57	1.49	1.42	1.32	1.24	1.17	1.05	0.93
20	7.20	2.06	1.87	1.74	1.61	1.57	1.52	1.44	1.38	1.28	1.20	1.11	0.97	0.86
22	7.72	2.00	1.82	1.69	1.56	1.53	1.47	1.40	1.34	1.24	1.17	1.04	0.91	0.81
24	8.24	1.95	1.77	1.64	1.52	1.49	1.43	1.36	1.30	1.21	1.13	0.97	0.85	0.76
26	8.76	1.90	1.72	1.60	1.49	1.45	1.40	1.33	1.27	1.18	1.07	0.91	0.80	0.71
28	9.28	1.86	1.69	1.56	1.45	1.42	1.37	1.30	1.24	1.15	1.01	0.86	0.75	0.67
30	9.80	1.82	1.65	1.53	1.42	1.39	1.34	1.27	1.22	1.13	0.95	0.82	0.71	0.63
32	10.37	1.78	1.62	1.50	1.39	1.36	1.31	1.25	1.19	1.08	0.90	0.77	0.68	0.60
34	10.94	1.75	1.59	1.47	1.37	1.33	1.29	1.22	1.17	1.02	0.85	0.73	0.64	0.57
36	11.51	1.71	1.56	1.45	1.34	1.31	1.26	1.20	1.15	0.97	0.81	0.70	0.61	0.54
38	12.08	1.69	1.53	1.42	1.32	1.29	1.24	1.18	1.13	0.93	0.77	0.66	0.58	0.52
40	12.65	1.66	1.51	1.40	1.30	1.27	1.22	1.16	1.11	0.89	0.74	0.63	0.55	0.49
45	14.08	1.60	1.45	1.35	1.25	1.22	1.18	1.12	0.99	0.80	0.66	0.57	0.50	0.44
50	15.50	1.54	1.40	1.30	1.21	1.18	1.14	1.03	0.90	0.72	0.60	0.52	0.45	0.40

Sample calculation

Required: Distance between main beams and between supports

Available: ○ 20 cm concrete thickness with total load of 7.20 kN/m²

Selected: ⬭ Distance between crossbeams of 0.5 m

Result: ▭ 1.74 m distance between main beams
(select next larger distance between main beams, ▱ here 1.75 m)
▭ 1.11 m distance between supports (check carrying capacity of supports)

Technical data HT **16**plus

Dimensions and tolerances

Dimensions	HT 16plus	Tolerances
Beam height	160 mm	± 2.0 mm
Chord thickness	35 mm	- 1.5%
Chord width	65 mm	- 1.5%
Web thickness	26.6 mm	± 0.5 mm

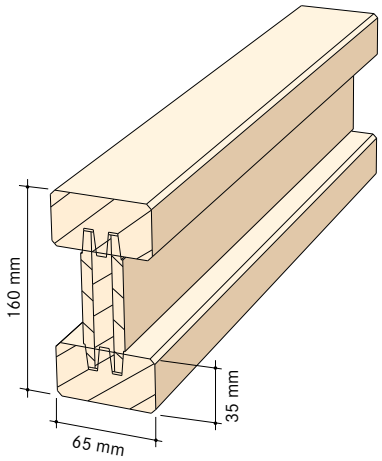
Product standard

Industrially manufactured formwork timber beams are to be used in supporting structures and formworks for concrete buildings. The load is applied in the direction of the formwork beam height. The EN 13377 standard specifies the classification, the requirements, and verification procedures for formwork beams in the heights h = 16, h = 20 and h = 24 cm.

Calculated values

According to EN 13377	Carrying capacity characteristics	
Lateral force	V_k = 18.4 kN	perm. Q = 8.5 kN
Bending moment	M_k = 5.9 kNm	perm. M = 2.7 kNm
Reaction of support	$R_{b,k}$ = 36.8 kN	

MOE x moment of inertia	EI = 212 kNm²	
Elasticity module of chord (C24)	E_{Gurt} = 11,000 N/mm²	
Elasticity module of web (SWP)	E_{Steg} = 6,700 N/mm²	



Standard lengths

2.45/2.50/2.65/2.90/3.30/3.60/3.90/4.20/4.50/ 4.90/5.90/max. 8.00 m

Weight

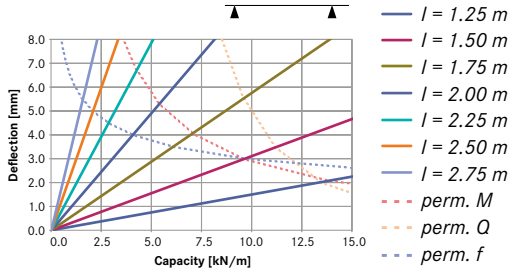
3.3 kg/m

Package units

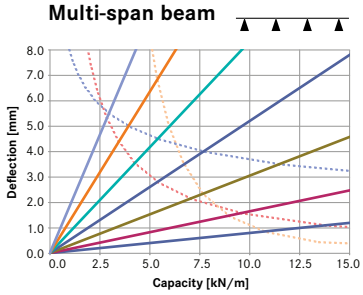
Standard package: 150 pieces

Span table

Single-span beam



Multi-span beam



Chain of Custody

		Table 1: Crossbeams Distance between crossbeams [m]								Table 2: Main beams Selected distance between main beams [m]				
		0.4	0.5	0.625	0.675	0.75	1	1.25	1.5	1.75	2	2.25	2.5	3
Floor thickness [cm]	Total load [KN/m²]	Max. support width of crossbeam = Max. distance between main beams								Max. permissible support width = Distance between supports				
10	4.60	2.97	2.76	2.56	2.50	2.41	2.17	1.94	1.77	1.64	1.53	1.44	1.37	1.22
12	5.12	2.82	2.62	2.43	2.37	2.29	2.05	1.84	1.68	1.55	1.45	1.37	1.30	1.09
14	5.64	2.70	2.51	2.33	2.27	2.19	1.96	1.75	1.60	1.48	1.38	1.30	1.19	0.99
16	6.16	2.59	2.41	2.24	2.18	2.10	1.87	1.67	1.53	1.42	1.32	1.21	1.09	0.91
18	6.68	2.50	2.33	2.16	2.10	2.03	1.80	1.61	1.47	1.36	1.26	1.12	1.01	0.84
20	7.20	2.43	2.25	2.09	2.04	1.97	1.73	1.55	1.41	1.31	1.17	1.04	0.93	0.78
22	7.72	2.36	2.19	2.03	1.98	1.91	1.67	1.50	1.37	1.24	1.09	0.97	0.87	0.73
24	8.24	2.29	2.13	1.98	1.93	1.86	1.62	1.45	1.32	1.17	1.02	0.91	0.82	0.68
26	8.76	2.24	2.08	1.93	1.88	1.81	1.57	1.40	1.28	1.10	0.96	0.85	0.77	0.64
28	9.28	2.19	2.03	1.88	1.84	1.76	1.53	1.36	1.21	1.03	0.91	0.80	0.72	0.60
30	9.80	2.14	1.99	1.84	1.80	1.71	1.48	1.33	1.14	0.98	0.86	0.76	0.69	0.57
32	10.37	2.10	1.95	1.81	1.76	1.67	1.44	1.29	1.08	0.93	0.81	0.72	0.65	0.54
34	10.94	2.06	1.91	1.77	1.71	1.62	1.41	1.23	1.02	0.88	0.77	0.68	0.61	0.51
36	11.51	2.02	1.88	1.73	1.67	1.58	1.37	1.17	0.97	0.83	0.73	0.65	0.58	0.49
38	12.08	1.99	1.84	1.69	1.63	1.54	1.34	1.11	0.93	0.79	0.70	0.62	0.56	0.46
40	12.65	1.95	1.81	1.65	1.59	1.51	1.31	1.06	0.89	0.76	0.66	0.59	0.53	0.44
45	14.08	1.88	1.75	1.57	1.51	1.43	1.19	0.95	0.80	0.68	0.60	0.53	0.48	0.40
50	15.50	1.82	1.67	1.49	1.44	1.36	1.08	0.87	0.72	0.62	0.54	0.48	0.43	0.36
55	16.93	1.77	1.60	1.43	1.38	1.30	0.99	0.79	0.66	0.57	0.50	0.44	0.40	0.33
60	18.35	1.72	1.53	1.37	1.32	1.22	0.92	0.73	0.61	0.52	0.46	0.41	0.37	0.31
65	19.78	1.65	1.48	1.32	1.26	1.13	0.85	0.68	0.57	0.49	0.42	0.38	0.34	0.28
70	21.20	1.60	1.43	1.27	1.17	1.06	0.79	0.63	0.53	0.45	0.40	0.35	0.32	0.26

Sample calculation

Required: Distance between main beams and between supports
Available: ○ 24 cm concrete thickness with total load of 8.24 kN/m²
Selected: ⬭ Distance between crossbeams of 0.625 m
Result: ▭ 1.98 m distance between main beams
(select next larger distance between main beams, here ▱ 2 m)
▭ 1.02 m distance between supports (check carrying capacity of supports)

Technical data HT **20**plus

Dimensions and tolerances

Dimensions	HT **20**plus	Tolerances
Beam height	200 mm	± 2.0 mm
Chord thickness	40 mm	- 1.5%
Chord width	80 mm	- 1.5%
Web thickness	26.6 mm	± 0.5 mm

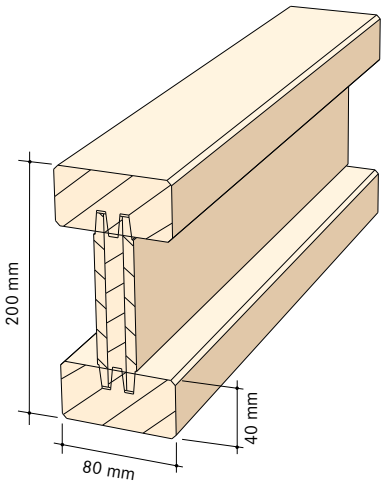
Product standard

The EN 13377 defines the classification, requirements and test methods for formwork timber beams with building heights of h = 16 cm, h = 20 cm and h = 24 cm. In Germany, the DIN EN 13377 applies in combination with DIN V 20000-2. The **HT 20**plus is marked with an "Ü" according to the regulations applicable in Germany.

Calculated values

According to EN 13377	Carrying capacity characteristics	
Lateral force	V_k = 23.9 kN	perm. Q = 11 kN
Bending moment	M_k = 10.9 kNm	perm. M = 5 kNm
Reaction of support	$R_{b,k}$ = 47.8 kN	

MOE x moment of inertia	EI = 486 kNm²	
Elasticity module of chord (C24)	E_{Gurt} = 11,000 N/mm²	
Elasticity module of web (SWP)	E_{Steg} = 6,700 N/mm²	



Standard lengths

2.45/2.50/2.65/2.90/3.30/3.60/3.90/4.20/4.50/ 4.90/5.90/max. 10.00 m

Weight

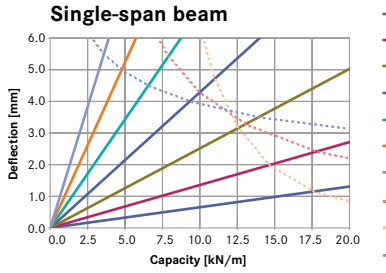
4.6 kg/m

Package units

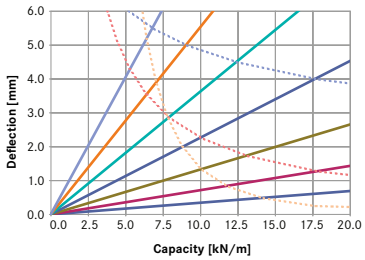
tandard package: 60 pieces, Container package: 100 pieces

Span table

Single-span beam



Multi-span beam



l = 1.25 m
l = 1.50 m
l = 1.75 m
l = 2.0t0 m
l = 2.25 m
l = 2.50 m
l = 2.75 m
perm. M
perm. Q
perm. f

Chain of Custody

		Table 1: Crossbeams Distance between crossbeams [m]								Table 2: Main beams Selected distance between main beams [m]				
		0.5	0.625	0.675	0.75	1	1.25	1.5	1.75	2	2.25	2.5	3	3.5
Floor thickness [cm]	Total load [KN/m²]	Max. support width of crossbeam = Max. distance between main beams								Max. permissible support width = Distance between supports				
10	4.60	3.64	3.38	3.29	3.18	2.89	2.64	2.41	2.23	2.09	1.97	1.87	1.59	1.37
12	5.12	3.46	3.21	3.13	3.02	2.74	2.50	2.28	2.11	1.98	1.86	1.72	1.43	1.23
14	5.64	3.30	3.07	2.99	2.89	2.62	2.38	2.17	2.01	1.88	1.73	1.56	1.30	1.11
16	6.16	3.18	2.95	2.87	2.77	2.52	2.28	2.08	1.93	1.79	1.59	1.43	1.19	1.02
18	6.68	3.07	2.85	2.77	2.68	2.43	2.19	2.00	1.85	1.65	1.46	1.32	1.10	0.94
20	7.20	2.97	2.76	2.69	2.59	2.36	2.11	1.92	1.75	1.53	1.36	1.22	1.02	0.87
22	7.72	2.88	2.68	2.61	2.52	2.28	2.04	1.86	1.63	1.42	1.27	1.14	0.95	0.81
24	8.24	2.81	2.61	2.54	2.45	2.20	1.97	1.78	1.53	1.33	1.19	1.07	0.89	0.76
26	8.76	2.74	2.54	2.48	2.39	2.14	1.91	1.67	1.44	1.26	1.12	1.00	0.84	0.72
28	9.28	2.68	2.49	2.42	2.34	2.08	1.86	1.58	1.35	1.19	1.05	0.95	0.79	0.68
30	9.80	2.62	2.43	2.37	2.29	2.02	1.80	1.50	1.28	1.12	1.00	0.90	0.75	0.64
35	11.23	2.50	2.32	2.26	2.18	1.89	1.57	1.31	1.12	0.98	0.87	0.78	0.65	0.56
40	12.65	2.39	2.22	2.16	2.05	1.74	1.39	1.16	0.99	0.87	0.77	0.70	0.58	0.50
45	14.08	2.30	2.13	2.05	1.95	1.56	1.25	1.04	0.89	0.78	0.69	0.63	0.52	0.45
50	15.50	2.23	2.03	1.96	1.85	1.42	1.14	0.95	0.81	0.71	0.63	0.57	0.47	0.41
55	16.93	2.16	1.94	1.87	1.73	1.30	1.04	0.87	0.74	0.65	0.58	0.52	0.43	0.37
60	18.35	2.09	1.87	1.78	1.60	1.20	0.96	0.80	0.69	0.60	0.53	0.48	0.40	0.34
65	19.78	2.01	1.78	1.65	1.48	1.11	0.89	0.74	0.64	0.56	0.49	0.45	0.37	0.32
70	21.20	1.94	1.66	1.54	1.38	1.04	0.83	0.69	0.59	0.52	0.46	0.42	0.35	0.30
75	22.50	1.89	1.56	1.45	1.30	0.98	0.78	0.65	0.56	0.49	0.43	0.39	0.33	0.28
80	23.80	1.83	1.48	1.37	1.23	0.92	0.74	0.62	0.53	0.46	0.41	0.37	0.31	0.26
85	25.10	1.75	1.40	1.30	1.17	0.88	0.70	0.58	0.50	0.44	0.39	0.35	0.29	0.25
90	26.40	1.67	1.33	1.23	1.11	0.83	0.67	0.56	0.48	0.42	0.37	0.33	0.28	0.24
95	27.70	1.59	1.27	1.18	1.06	0.79	0.64	0.53	0.45	0.40	0.35	0.32	0.26	0.23
100	29.00	1.52	1.21	1.12	1.01	0.76	0.61	0.51	0.43	0.38	0.34	0.30	0.25	0.22

Sample calculation

Required: Distance between main beams and between supports
Available: ○ 30 cm concrete thickness with total load of 9.80 kN/m²
Selected: ⬭ Distance between crossbeams of 0.75 m
Result: ▭ 2.29 m distance between main beams
(select next larger distance between main beams, here ▱ 2.5 m)
▭ 0.90 m distance between supports (check carrying capacity of supports)

Technical data HT 24plus

Dimensions and tolerances

Dimensions	HT 24plus	Tolerances
Beam height	240 mm	± 2.0 mm
Chord thickness	40 mm	- 1.5%
Chord width	80 mm	- 1.5%
Web thickness	26.6 mm	± 0.5 mm

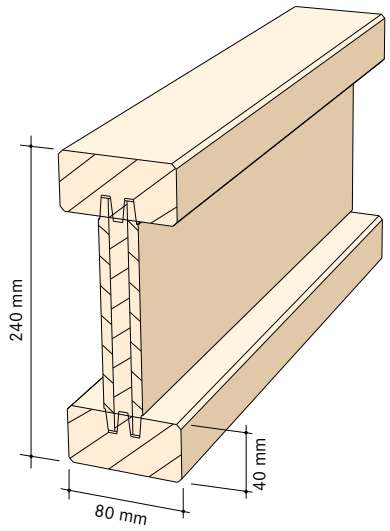
Product standard

Industrially manufactured formwork timber beams are to be used in supporting structures and formworks for concrete buildings. The load is applied in the direction of the formwork beam height. The EN 13377 standard specifies the classification, the requirements, and verification procedures for formwork beams in the heights h = 16, h = 20 and h = 24 cm.

Calculated values

According to EN 13377	Carrying capacity characteristics	
Lateral force	V_k = 28.2 kN	perm. Q = 13 kN
Bending moment	M_k = 14.1 kNm	perm. M = 6.5 kNm
Reaction of support	$R_{b,k}$ = 56.4 kN	

MOE x moment of inertia	EI = 775 kNm²	
Elasticity module of chord (C24)	E_{Gurt} = 11,000 N/mm²	
Elasticity module of web (SWP)	E_{Steg} = 6,700 N/mm²	



Standard lengths

2.45/2.50/2.65/2.90/3.30/3.60/3.90/4.20/4.50/ 4.90/5.90/max. 10.00 m

Weight

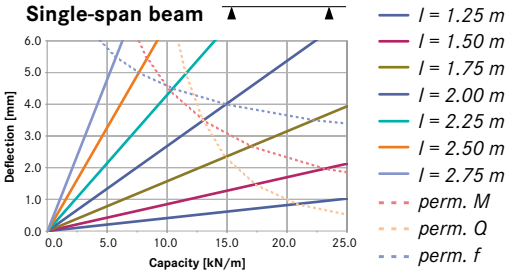
5.1 kg/m

Package units

Standard package: 80 pieces

Span table

Single-span beam



Multi-span beam

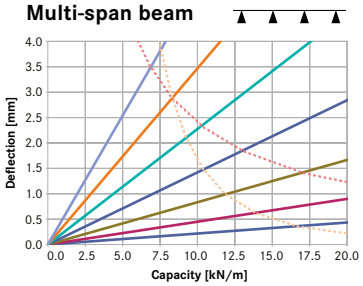


		Table 1: Crossbeams Distance between crossbeams [m]								Table 2: Main beams Selected distance between main beams [m]				
		0.5	0.625	0.675	0.75	1	1.25	1.5	1.75	2	2.25	2.5	3	3.5
Floor thickness [cm]	**Total load** [KN/m²]	**Max. support width of crossbeam = Max. distance between main beams**								**Max. permissible support width = Distance between supports**				
16	6.16	3.71	3.44	3.36	3.24	2.91	2.60	2.37	2.20	2.05	1.88	1.69	1.41	1.21
18	6.68	3.58	3.33	3.24	3.13	2.79	2.50	2.28	2.11	1.95	1.73	1.56	1.30	1.11
20	7.20	3.47	3.22	3.14	3.03	2.69	2.40	2.19	2.03	1.81	1.60	1.44	1.20	1.03
22	7.72	3.37	3.13	3.05	2.94	2.60	2.32	2.12	1.92	1.68	1.50	1.35	1.12	0.96
24	8.24	3.28	3.05	2.97	2.87	2.51	2.25	2.05	1.80	1.58	1.40	1.26	1.05	0.90
26	8.76	3.20	2.97	2.90	2.80	2.44	2.18	1.98	1.70	1.48	1.32	1.19	0.99	0.85
28	9.28	3.13	2.90	2.83	2.73	2.37	2.12	1.87	1.60	1.40	1.25	1.12	0.93	0.80
30	9.80	3.06	2.84	2.77	2.66	2.30	2.06	1.77	1.52	1.33	1.18	1.06	0.88	0.76
32	10.37	3.00	2.78	2.71	2.59	2.24	2.00	1.67	1.43	1.25	1.11	1.00	0.84	0.72
34	10.94	2.94	2.73	2.65	2.52	2.18	1.90	1.58	1.36	1.19	1.06	0.95	0.79	0.68
36	11.51	2.89	2.68	2.59	2.45	2.13	1.81	1.51	1.29	1.13	1.00	0.90	0.75	0.65
38	12.08	2.84	2.62	2.53	2.40	2.07	1.72	1.43	1.23	1.08	0.96	0.86	0.72	0.61
40	12.65	2.80	2.56	2.47	2.34	2.03	1.64	1.37	1.17	1.03	0.91	0.82	0.69	0.59
45	14.08	2.69	2.43	2.34	2.22	1.85	1.48	1.23	1.06	0.92	0.82	0.74	0.62	0.53
50	15.50	2.59	2.32	2.23	2.11	1.68	1.34	1.12	0.96	0.84	0.75	0.67	0.56	0.48
55	16.93	2.48	2.22	2.13	2.02	1.54	1.23	1.02	0.88	0.77	0.68	0.61	0.51	0.44
60	18.35	2.38	2.13	2.05	1.89	1.42	1.13	0.94	0.81	0.71	0.63	0.57	0.47	0.40
65	19.78	2.29	2.05	1.95	1.75	1.31	1.05	0.88	0.75	0.66	0.58	0.53	0.44	0.38
70	21.20	2.21	1.96	1.82	1.64	1.23	0.98	0.82	0.70	0.61	0.55	0.49	0.41	0.35
75	22.50	2.15	1.85	1.71	1.54	1.16	0.92	0.77	0.66	0.58	0.51	0.46	0.39	0.33
80	23.80	2.09	1.75	1.62	1.46	1.09	0.87	0.73	0.62	0.55	0.49	0.44	0.36	0.31
85	25.10	2.04	1.66	1.53	1.38	1.04	0.83	0.69	0.59	0.52	0.46	0.41	0.35	0.30
90	26.40	1.97	1.58	1.46	1.31	0.98	0.79	0.66	0.56	0.49	0.44	0.39	0.33	0.28
95	27.70	1.88	1.50	1.39	1.25	0.94	0.75	0.63	0.54	0.47	0.42	0.38	0.31	0.27
100	29.00	1.79	1.43	1.33	1.20	0.90	0.72	0.60	0.51	0.45	0.40	0.36	0.30	0.26

Sample calculation

Required: Distance between main beams and between supports

Available: ○ 36 cm concrete thickness with total load of 11.51 kN/m²

Selected: ⬭ Distance between crossbeams of 0.75 m

Result: ▭ 2.45 m distance between main beams

(select next larger distance between main beams, here ▱ 2.5 m)

▭ 0.90 m distance between supports (check carrying capacity of supports)

Technical data HT 30plus

Dimensions and tolerances

Dimensions	HT 30plus	Tolerances
Beam height	300 mm	± 2.0 mm
Chord thickness	57 mm	- 1.5%
Chord width	96 mm	- 1.5%
Web thickness	26.6 mm	± 0.5 mm

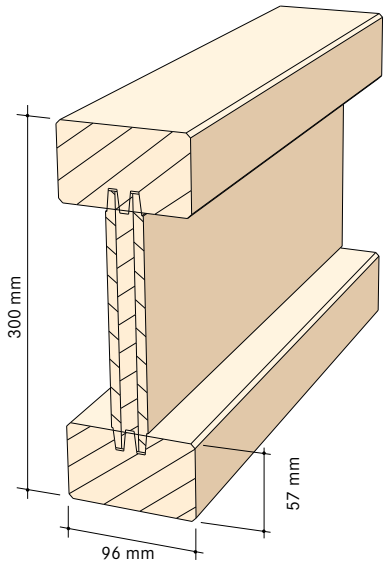
Product standard

Industrially manufactured formwork timber beams are to be used in supporting structures and formworks for concrete buildings. The load is applied in the direction of the formwork beam height. The EN 13377 standard specifies the classification, the requirements, and verification procedures for formwork beams in the heights h = 16, h = 20 and h = 24 cm. We have derived the calculated values for the height h = 30 cm from this standard and confi rmed it in tests.

Calculated values

According to EN 13377	Carrying capacity characteristics	
Lateral force	V_k = 34.5 kN	perm. Q = 15 kN
Bending moment	M_k = 26.2 kNm	perm. M = 12 kNm
Reaction of support	$R_{b,k}$ = 69 kN	

MOE x moment of inertia	EI = 1,906 kNm²	
Elasticity module of chord (C24)	E_{Gurt} = 11,000 N/mm²	
Elasticity module of web (SWP)	E_{Steg} = 6,700 N/mm²	



Standard lengths

2.45/2.50/2.65/2.90/3.30/3.60/3.90/4.20/4.50/4.90/5.90/max. 6.00 m

Weight

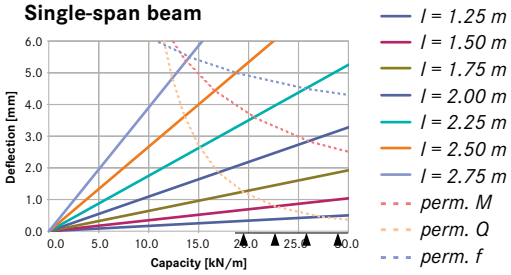
7.6 kg/m

Package units

Standard package: 51 pieces

Span table

Single-span beam



Multi-span beam

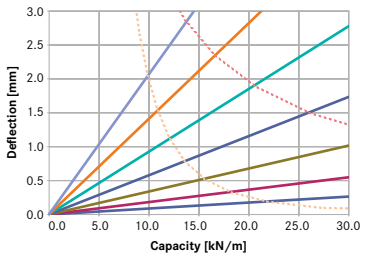


		Table 1: Crossbeams Distance between crossbeams [m]								Table 2: Main beams Selected distance between main beams [m]				
		0.625	0.75	0.875	1	1.25	1.5	1.75	2	2.25	2.5	3	3.5	4
Floor thickness [cm]	Total load [KN / m²]	Max. support width of crossbeam = Max. distance between main beams								Max. permissible support width = Distance between supports				
16	6.16	4.65	4.38	4.16	3.98	3.68	3.35	3.11	2.76	2.45	2.21	1.84	1.58	1.38
18	6.68	4.49	4.22	4.01	3.84	3.53	3.22	2.91	2.54	2.26	2.04	1.70	1.45	1.27
20	7.20	4.35	4.09	3.89	3.72	3.40	3.10	2.70	2.36	2.10	1.89	1.57	1.35	1.18
22	7.72	4.22	3.97	3.77	3.61	3.28	2.94	2.52	2.20	1.96	1.76	1.47	1.26	1.10
24	8.24	4.11	3.87	3.68	3.52	3.18	2.75	2.36	2.06	1.83	1.65	1.38	1.18	1.03
26	8.76	4.01	3.77	3.59	3.43	3.08	2.59	2.22	1.94	1.73	1.55	1.29	1.11	0.97
28	9.28	3.92	3.69	3.50	3.35	2.93	2.44	2.09	1.83	1.63	1.47	1.22	1.05	0.92
30	9.80	3.84	3.61	3.43	3.26	2.78	2.31	1.98	1.73	1.54	1.39	1.16	0.99	0.87
32	10.37	3.76	3.54	3.36	3.17	2.62	2.19	1.87	1.64	1.46	1.31	1.09	0.94	0.82
34	10.94	3.69	3.47	3.30	3.08	2.49	2.07	1.78	1.55	1.38	1.24	1.04	0.89	0.78
36	11.51	3.62	3.41	3.21	2.95	2.36	1.97	1.69	1.48	1.31	1.18	0.98	0.84	0.74
38	12.08	3.56	3.35	3.14	2.81	2.25	1.88	1.61	1.41	1.25	1.13	0.94	0.80	0.70
40	12.65	3.50	3.30	3.07	2.69	2.15	1.79	1.54	1.34	1.19	1.08	0.90	0.77	0.67
45	14.08	3.37	3.14	2.76	2.42	1.93	1.61	1.38	1.21	1.07	0.97	0.81	0.69	0.60
50	15.50	3.26	2.92	2.51	2.19	1.75	1.46	1.25	1.10	0.97	0.88	0.73	0.63	0.55
55	16.93	3.14	2.68	2.30	2.01	1.61	1.34	1.15	1.00	0.89	0.80	0.67	0.57	0.50
60	18.35	2.96	2.47	2.12	1.85	1.48	1.24	1.06	0.93	0.82	0.74	0.62	0.53	0.46
65	19.78	2.75	2.29	1.96	1.72	1.38	1.15	0.98	0.86	0.76	0.69	0.57	0.49	0.43
70	21.20	2.57	2.14	1.83	1.60	1.28	1.07	0.92	0.80	0.71	0.64	0.53	0.46	0.40
75	22.50	2.42	2.01	1.73	1.51	1.21	1.01	0.86	0.76	0.67	0.60	0.50	0.43	0.38
80	23.80	2.29	1.90	1.63	1.43	1.14	0.95	0.82	0.71	0.63	0.57	0.48	0.41	0.36
85	25.10	2.17	1.81	1.55	1.35	1.08	0.90	0.77	0.68	0.60	0.54	0.45	0.39	0.34
90	26.40	2.06	1.72	1.47	1.29	1.03	0.86	0.74	0.64	0.57	0.52	0.43	0.37	0.32
95	27.70	1.96	1.64	1.40	1.23	0.98	0.82	0.70	0.61	0.55	0.49	0.41	0.35	0.31
100	29.00	1.88	1.56	1.34	1.17	0.94	0.78	0.67	0.59	0.52	0.47	0.39	0.33	0.29

Sample calculation

Required: Distance between main beams and between supports

Available: ○ 45 cm concrete thickness with total load of 14.08 kN/m²

Selected: ⬭ Distance between crossbeams of 0.875 m

Result: ▭ 2.76 m distance between main beams

(select next larger distance between main beams, here ▱ 3 m)

▭ 0.81 m distance between supports (check carrying capacity of supports)

PEFC
Chain of Custody

TÜV AUSTRIA

Hardly any crack formations

due to the beam structure in the covering layers, not even after several uses.

The special PU edge sealing

prevents the ingress of moisture and sticking of concrete slurry.

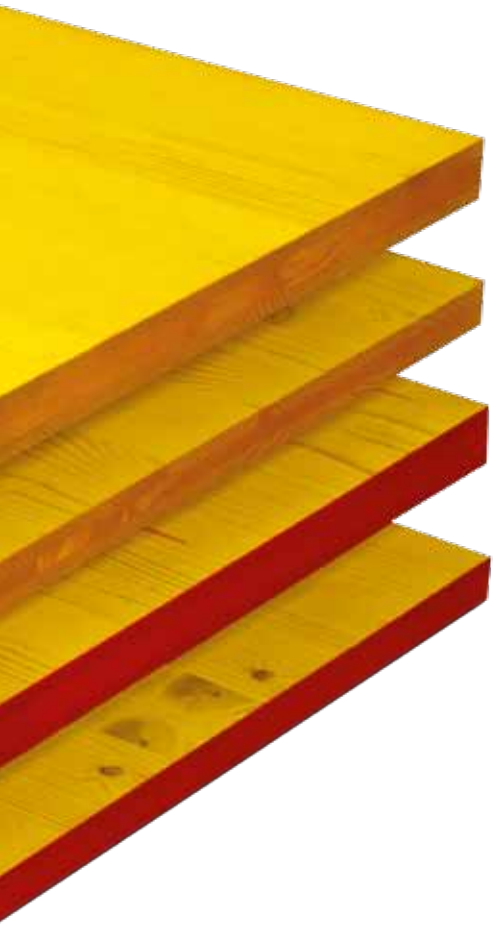
The surface,

sanded across the entire surface and coated with a melamin resin, provides the ideal pore structure that guarantees a unique concrete face.

No breaking of longitudinal edges,

even with strong mechanical stress, due to continuous medium plies.

Properties



3 glued layers in top quality for the highest requirements

K1 **yellow**plan is the concrete formwork panel made by Mayr-Melnhof Holz. The panels are used anywhere where top quality, durability, and a fl awless concrete appearance is required. The K1 **yellow**plan is manufactured in Reuthe in Austria's Bregenzerwald region and is promptly delivered from there to your location, or by request directly to the construction site. The legendary K1 **yellow**plan has been manufactured for over 50 years. The new procedure was recognized as a path breaking achievement from the very beginning. Since the 80s the K1 **yellow**plan has been manufactured on an industria production line.

Today this 3-ply laminated formwork panel continues to impress with its unique quality and high form stability.

The K1 **yellow**plan formwork panel is made in a jumbo size of 2 x 6 m and thicknesses of 21 and 27 mm and is then cut to smaller standard sizes.

The enclosed, laminated outer and intermediate layers without concealed edge bands and showing primarily vertical growth rings are the foundation for the clean K1 **yellow**plan typical concrete appearance.

Technical data K1 yellowplan

Product

3-ply concrete formwork panel with smooth surface and melamine resin coating according to Austrian standard ÖN B 3023 solid wood panels.

Wood species

Spruce, fir, mixed types permitted

Wood moisture

12% ± 3%

Gluing

BFU 100 (AW 100) in accordance with ÖN B 3023

Weight

21 mm approx. 10.0 kg/m²
27 mm approx. 12.5 kg/m²

Features of panel

- Manufactured as a jumbo size panel, small sizes are cut to exact specifications from jumbo formats
- Locked, glued crosswise
- Fully enclosed, laminated outer and intermediate layer, no concealed edge bands
- Outer layers predominantly showing vertical growth rings, no clamps
- Seamlessly glued intermediate layer, ensures that the longitudinal edges do not tear off
- Seamlessly sanded
- Resistant melamine coating
- Water repellent edge seal

Formats

Standard formats (length x width in cm)
100 x 50
150 x 50
200 x 50/100
250 x 50/100
300 x 50/100

Jumbo formats (length x width in cm)
400 x 50/100/150/200
500 x 50/100/150/200
600 x 50/100/150/200

Thicknesses

21 and 27 mm

Surface quality

- Seamlessly sanded surface
- Resistant melamine coating with approx. 130 g/m², each side

Edge seal

- Water repellent formwork edge finish, yellow
- PU edge seal, red with jumbo- and special sizes with standard formats (except for 100 x 50 cm)

Packaging

Packages: 50 pieces of 21 mm or 40 pieces of 27 mm thickness

- Delivered suitable for the construction site, protected by integrated supporting timber
- Upon request, the packages will be wrapped in plastic foil
- The package units for jumbo formats are subject to arrangement

Dimensional tolerances

Thicknesses	21 and 27 mm	± 1 mm
Widths	50 ≤ 200 cm	± 1 mm
Lengths	100 ≤ 250 cm	± 1 mm
	300 ≤ 600 cm	± 2 mm
Longitudinal curvature	100 ≤ 300 cm	± 1 mm
	301 ≤ 600 cm	± 1.5 mm
	Breiten < 50 cm	± 1 ‰

Design values

Mechanical properties	**21 mm**	**27 mm**	**Minimal value ÖN B 3023**
Minimal value	40 N/mm²	35 N/mm²	22 N/mm²
Modulus of elasticity (mean value)	10,000 N/mm²	10,000 N/mm²	10,000 N/mm²

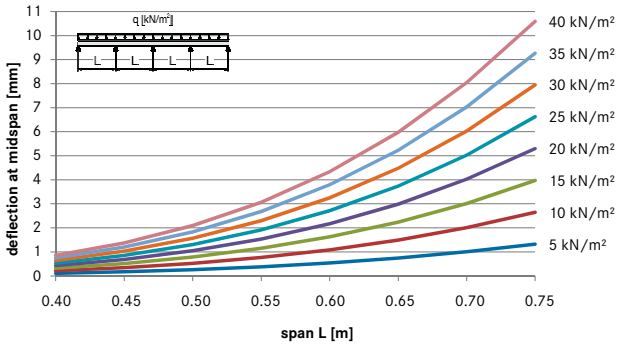
The calculated values with a wood moisture of 12%. With heavy moisture penetration up to fiber saturation point, the values for bending strength and flexural modulus of elasticity may be up to 30% lower.

Quality

		Span L [m]							
d = 21 mm		0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75
Load q [kN/m²]	5 kN/m²	0.11	0.17	0.26	0.38	0.54	0.75	1.00	1.32
	10 kN/m²	0.21	0.34	0.52	0.77	1.08	1.49	2.01	2.65
	15 kN/m²	0.32	0.51	0.78	1.15	1.63	2.24	3.01	3.97
	20 kN/m²	0.43	0.69	1.05	1.53	2.17	2.99	4.02	5.30
	25 kN/m²	0.54	0.86	1.31	1.91	2.71	3.74	5.02	6.62
	30 kN/m²	0.64	1.03	1.57	2.30	3.25	4.48	6.03	7.95
	35 kN/m²	0.75	1.20	1.83	2.68	3.80	5.23	7.03	9.27
	40 kN/m²	0.86	1.37	2.09	3.06	4.34	5.98	8.04	10.59

d = 21 mm
E = 10,000 N/mm² *of K1 yellowplan d = 21 mm*
k = 0.646 *Deformation factor contingent on number of fields for constant load*

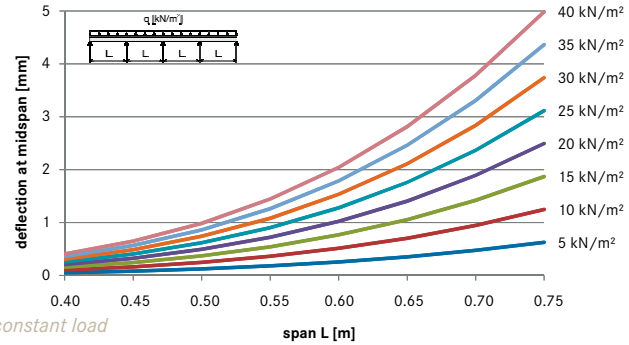
Deflection of formwork panel **K1 yellow**plan d = 21 mm



		Span L [m]							
d = 27 mm		0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75
Load q [kN/m²]	5 kN/m²	0.05	0.08	0.12	0.18	0.26	0.35	0.47	0.62
	10 kN/m²	0.10	0.16	0.25	0.36	0.51	0.70	0.95	1.25
	15 kN/m²	0.15	0.24	0.37	0.54	0.77	1.05	1.42	1.87
	20 kN/m²	0.20	0.32	0.49	0.72	1.02	1.41	1.89	2.49
	25 kN/m²	0.25	0.40	0.62	0.90	1.28	1.76	2.36	3.12
	30 kN/m²	0.30	0.48	0.74	1.08	1.53	2.11	2.84	3.74
	35 kN/m²	0.35	0.57	0.86	1.26	1.79	2.46	3.31	4.36
	40 kN/m²	0.40	0.65	0.98	1.44	2.04	2.81	3.78	4.98

d = 27 mm
E = 10,000 N/mm² *of K1 yellowplan d = 27 mm*
k = 0.646 *Deformation factor contingent on number of fields for constant load*

Deflection of formwork panel **K1 yellow**plan d = 27 mm



Product standard and quality definition

The product standard for 3-ply concrete formwork panels (ÖN B 3023) refers, for purposes of classifi cation and test procedures for factory-owned production control, to the relevant European standards on solid wood panels. In terms of wood quality, the surface refl ects the appearance class S for solid wood panels (EN 13017-1 Tab.1). The surface structure and coating is assigned to the smooth GL category according to ÖN B 3023.

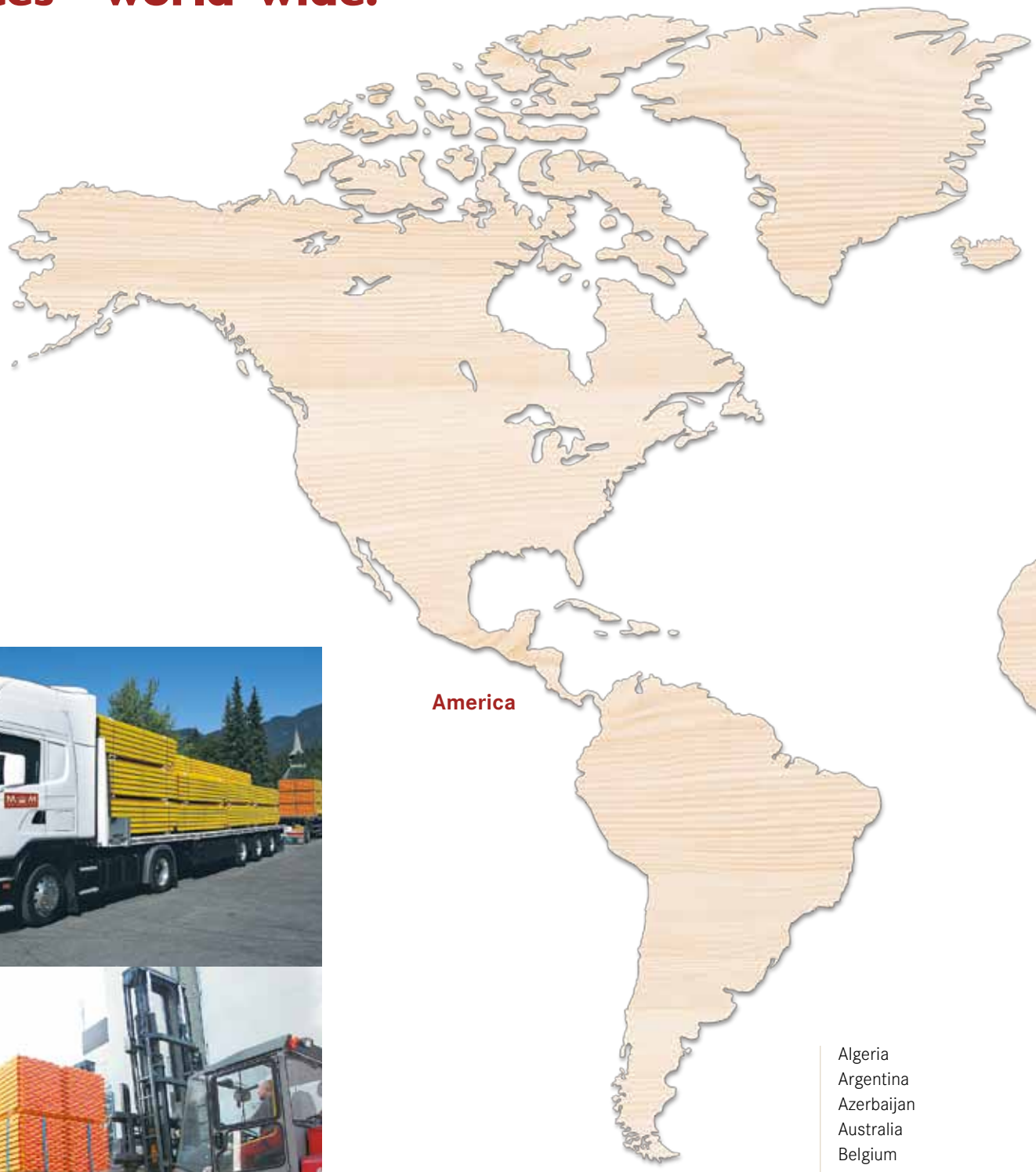
❶ Concrete appearance

Due to the lamella structure of the outer layers, the concrete will reveal a smooth and light wood grain which becomes more visible with the increase of the panels service life. The yellow melamine coating protects the panel and ensures the surface finish. It is classified as lightly absorbent. With time and the number of usages, the absorptive capacity of the panel surface decreases and the concrete face becomes lighter.

❷ Fair-faced concrete

A variety of experience is available in the use of 3-ply melamine coated concrete formwork panels for fair-faced concrete. Depending on the materials, surface defects in the wood (knots, resin pockets, nail holes, fi lled knot holes or cracks) will infl uence the absorptive capacity of the formwork facing and cause dark spots in the concrete when fi rst using panels. Better results for fair-faced concrete are obtained starting with the 2nd concrete use when residues on the melamine coating from the formwork facing are removed through alkaline reaction or neutralized by the concrete. The recommendations and guidelines in the cement industry must be followed - e.g. leafl et for fair-faced concrete (version of August 2004) published by DBV and BDZ.

Formwork technology for construction sites – world-wide!



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8 Locations

4 Sawmills
4 Timber processing plants
2 Pellets production sites
3 Briquettes production sites

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Russia

Richen

Germany

Paskov

Czech Republic

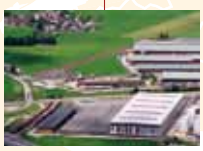
Leoben

Frankenmarkt

Austria

Kalwang

Reuthe



Gaishorn am See

Your local contact

Mayr-Melnhof Holz Gaishorn GmbH
Nr. 182 · 8783 Gaishorn am See · Austria
T +43 3617 2151 0 · **F** +43 3617 2151 10 · gaishorn@mm-holz.com

Mayr-Melnhof Holz Gaishorn GmbH
Werk Kalwang · Pisching 30 · 8775 Kalwang · Austria
T +43 3846 8181 0 · **F** +43 3846 8181 29 · kalwang@mm-holz.com

Mayr-Melnhof Holz Reuthe GmbH
Vorderreuthe 57 · 6870 Reuthe · Austria
T +43 5574 804 0 · **F** +43 5574 804 201 · reuthe@mm-holz.com

Mayr-Melnhof Holz Richen GmbH
Römerstraße 20 · 75031 Eppingen-Richen · Germany
T +49 7262 605 0 · **F** +49 7262 605 35 · richen@mm-holz.com

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